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## A New Species of the Family Agnaridae (Crustacea : Isopoda) from Kurehayama Hill, Toyama, middle Japan \*

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### 富山市呉羽丘陵から発見された ハヤシワラジムシ科等脚目甲殻類の1新種

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富山県の中央部にある呉羽丘陵東麓に位置する富山市民俗民芸村売薬資料館構内から未記載のハヤシワラジムシの1種が発見され、新種*Lucasioides kurehaensis* (和名：クレハヤマハヤシワラジムシ：新称)として記載した。本新種は富山県内南砺市等から報告されている*Lucasioides toyamaensis*, Nunomura (2008)と最も類似するが(1)オス第1腹肢外縁が波状であること、(2)オス第7胸節腕節外縁が幾分膨らむが、著しくないこと、(3)目が小さく、側方に位置し、個眼数が多いこと、(4)第一触角の感覚剛毛数が少ないこと、(5)第5腹肢外肢が長いこと、(6)体色が濃いことおよび(7)オス第2腹肢内肢は尖り、外肢外縁に湾入がないことによって区別される。新種のホロタイプは富山市科学博物館に保管される。あわせて種名決定に至らなかったが、同村構内から発見されたヒナワラジムシ属*Agnara*の1種の形態について形態を記載した。

キーワード：等脚類, 新種, 富山, ハヤシワラジムシ科, クレハヤマハヤシワラジムシ, 分類学

**Key words** : new species, Toyama, taxonomy, Agnaridae, *Lucasioides kurehaensis*, Isopoda

In July 2012, I made a small survey on terrestrial isopod fauna at the plot of Toyama Municipal Folkcraft Village (Nunomura, 2013) which is located at the east foot of Kurehayama Hill, in the middle part of Toyama Prefecture from south to north. During the survey, I happened to find strange specimens from the yard of the Museum of Medicine Peddlers. As the result of my identification, the species was proved to belong to the genus *Lucasioides*, new to science. The type series is deposited at Toyama Science Museum, Toyama (TOYA), Osaka Museum of Natural History (OMNH) and Kitakyushu Museum of Natural History and Human History, Kitakyushu (KMNH). Size of specimens is indicated by the body length (BL) measured from the midpoint of the anterior margin of the head to the midpoint of the posterior margin of the pleotelson.

At the same time, I described another strange specimen belonging to the genus *Agnara* from there.

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**Oder Isopoda**  
**Suborder Oniscidea**  
**Family Agnaridae**

***Lucasioides kurehaensis* n.sp.**

**(Japanese: Kurehayama-hayashi-warajimushi, new)**

**(Figs. 1-3)**

*Material examined*: 2♂♂ (1♂ holotype, 6.1 mm in body length and 1♂ paratype, 5.5 mm in body length) and 13♀♀ (1♀ allotype, 7.7 mm in body length and 12♀♀ paratypes, 4.4-8.3 mm in body length), under a *Cryptomeria* tree, Museum of Medicine Peddlers, Toyama Municipal Volkcraft Village, east foot of Kurehayama Hill, Toyama-shi, 4, July 2012; coll. Noboru Nunomura; 2♂♂ (paratypes, 6.1-6.2 mm in body length) and 4♀♀ (paratypes, 4.3-6.9 mm in body length), same locality, 9, Oct. 2012, coll. Noboru Nunomura.

The type series is deposited as follows: holotype (TOYA Cr-23380), allotype (TOYA Cr-23381), and 9 paratypes (TOYA Cr-23382~23390), at Toyama Science Museum, Toyama and 5 paratypes (OMNH Ar-9513~9517) at Osaka Museum of Natural History, 5 paratypes (1♂, KMNH IvR 500648 and 4♀♀, KMNH IvR 500649~500652), at Kitakyushu Museum of Natural History and Human History, Kitakyushu.

*Description of male*: Body (Fig. 1A) 2.0 times as long as wide. Color dark brown, with paler irregular patterns on dorsal surface. Cephalon with a rectangular lateral projection. Linea frontalis Fig. 1B with a low bulge in medial part. Eyes relatively small, situated laterally; each with about 30 ommatidia. Tergites with many minute granulations. Noduli lateralis of pereonal somites 2-4, 7 far from each lateral border (Fig. 3). Pleotelson triangular, without concavity on lateral margin.

Antennule (Fig. 1C) 3-segmented; terminal segment with 5 aesthetascs at the tip. Antenna (Fig. 1D), reaching the boundary of second and third pereonal somites, composed of 5 peduncular segments and 2 flagellar segments; distal flagellar segment 2.2 times as long as the basal one.

Right mandible (Fig. 1E): pars incisiva 3-headed; lacinia mobilis not chitinized and forms a single tooth; 2 penicils; processus molaris represented by a tuft of setae. Left mandible (Fig. 1F): pars incisiva 3-headed; lacinia mobilis incisiva 3-headed; 3 penicils; processus molaris represented by a tuft of setae. Maxillula, mesial endite (Fig. 1G) with 2 plumose setae and a small apical projection; lateral endite (Fig. 1H) with 10 simple setae on distal end. Maxilla (Fig. 1I) bilobed: medial lobe wider than lateral lobe, with short setae sparsely and sensilla; lateral lobe with much hair. Maxilliped (Fig. 1J): palp narrow and two-segmented; endite with a spur and a strong tooth.

Pereopod 1 (Fig. 2A): basis 3 times as long as wide, with more than 18 setae on inner side; ischium 55% as long as basis; merus a little shorter than exopod, with many long setae on inner margin; carpus as long as merus, with 23-25 setae including 7-8 bifurcated ones and antenna grooming-brush; propodus as long as carpus, with about 20 shorter setae on basal half and 3 longer setae on distal part of inner margin; dactylus with a relatively short inner claw and a flagellum-shaped dactylar setae.

Pereopod 2 (Fig. 2B): basis rectangular, 2.6 times as long as wide; ischium 0.8 times as long as basis, with 6-7 setae on inner margin and a seta on outer margin; merus as long as ischium, with 22-24 long setae on inner margin; carpus a little longer than merus, with many long setae on inner area; propodus 0.8 times as long as carpus; dactylus with a relatively short inner claw and a dactylar seta.

Pereopod 3 (Fig. 2C): basis rectangular, 2.8 times as long as wide; ischium 0.8 times as long as basis, with 6-8 setae on inner margin and 2 strong setae on outer margin; merus a little shorter than ischium, with 15-16 long setae on inner margin; carpus a little longer than merus, with many long setae on inner area but more sparsely than those of pereopods 2; propodus as long as carpus; dactylus with a relatively short inner claw and a dactylar seta.

Pereopods 4-5 (Fig. 2D-E) similar in shape: basis rectangular, 3.4 times as long as wide; ischium 0.4 times as long as basis, with 4-5 setae on inner margin and 2 strong setae on distal margin; merus a little shorter

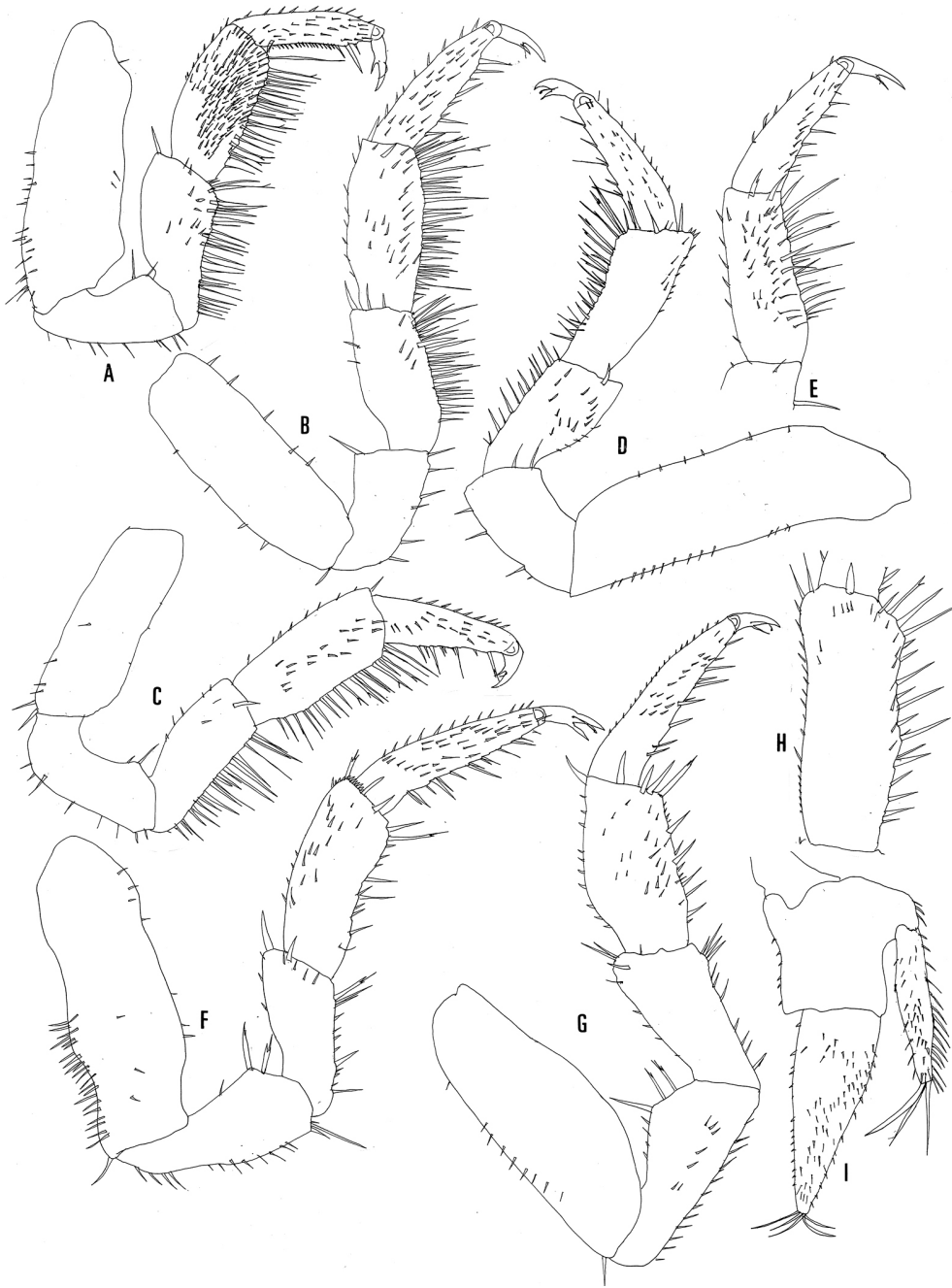
than ischium, with 15-16 setae on inner margin and the longest one; carpus a little longer than merus, with 22-26 long setae including bifurcated ones on inner area but more sparsely than those of pereopods 2-3; propodus as long as carpus; dactylus with a relatively short inner claw and a dactylar seta.

Pereopod 6(Fig. 2F): basis 2.6 times as long as wide, with many setae on distal half of inner side; ischium 0.7 times as long as basis, with 15-16 setae on inner margin and 2 strong bifurcated setae on sternal margin; merus 0.7 times as long as ischium, with 4 longer and several shorter setae on inner margin and 2 strong ones on outer distal area; carpus 1.2 times longer than merus, with 4 longer and several shorter setae on inner



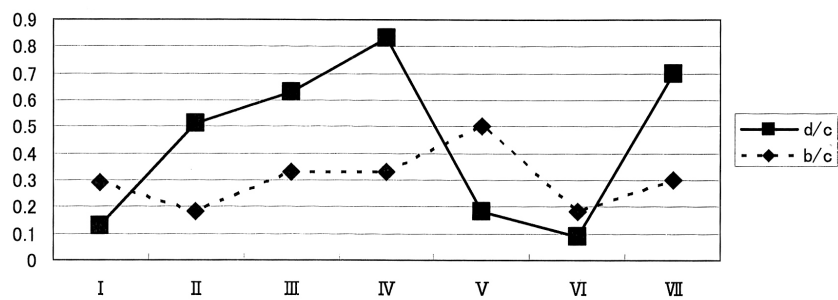
**Fig. 1** *Lucasioides kurehaensis* n.sp.

A, Dorsal view of body; B, Frontal view of cephalon; C, Antennule; D, Antenna; E, Right mandible; F, Left mandible; G, Mesial endite of maxillula; H, Lateral endite of maxillula; I, Maxilla; J, Maxilliped; K, Penes and endopod of pleopod 1; L, Exopod of pleopod 1; M, Pleopod 2; N, Exopod of pleopod 3; O, Exopod of pleopod 4; P, Exopod of pleopod 5 (All: holotype male).



**Fig. 2** *Lucasioides kurehaensis*, n.sp.

A-G, Pereopods 1-7 male; H, Carpus of pereopod 7 of female; I Uropod (A-G, and I: holotype male, H: allotype female).



**Fig. 3** *Lucasioides kurehaensis*, n.sp.

Position of noduli lateralis of holotype male.

margin and 2 strong on outer distal area ; propodus as long as carpus, with 13-14 setae on inner margin and 12-13 setae on outer margin; dactylus with a relatively short inner claw and a dactylar seta.

Pereopod 7(Fig. 2G): basis 2.6 times as long as wide, with 9-10 setae on inner margin; ischium 0.7 times as long as basis, with 12-13 setae on inner margin and 3 strong bifurcated setae on sternal margin; merus three-fourths as long as ischium, with 12-13 setae on inner margin and 7-8 setae on outer distal area; outer border of carpus 1.2 times longer than merus, outer margin slightly protruded in male, with 5 setae on distal margin; propodus a little longer than carpus, with 11-12 setae on inner margin and 22-24 short setae on outer margin; dactylus with a relatively short inner claw and a dactylar seta.

Penes (Fig. 1K) fusiform, 5.5 times as long as wide.

Pleopod 1: endopod (Fig. 1K) straight and apical area bent outward, with a series of; 23-27 small denticles along the inner end of distal area; exopod (Fig. 1L) rectangular, distal part of inner margin sinuate; distal margin sinuate, bearing a seta at inner distal end; distal half of outer margin also sinuated.

Pleopod 2(Fig. 1M): endopod tapering towards the tip and exceeding the tip of exopod; exopod rounded, with 6 setae on outer margin.

Pleopod 3(Fig. 1N): exopod rounded right-angled triangle; with 8-9 short setae on inner margin and 10 setae on outer margin.

Pleopod 4(Fig. 1O) a little narrower than pleopod 3: exopod rounded right- angled triangle; with 9-10 setae on outer margin.

Pleopod 5(Fig. 1P): exopod rounded right angled-triangle; two rows of pectinated scales present on dorsal face and 6 setae on outer margin.

Uropod (Fig. 2I): peduncle almost square; endopod relatively robust; exopod narrow, three-fourths as long as endopod.

Female similar to male except sexual characters and not protruded carpus of seventh pereopod (Fig. 2H).

Etymology: “Kureha” is name of type locality; Toyama Municipal Volkcraft Village is located at the east foot of Kurehayama-hill.

*Remarks*: Hitherto, more than 16 species have been recorded of the genus. Among them, the present new species is most closely allied to *Lucasioides yokohatai* reported from the mole's nest in having, but is separated from the latter in the following features: (1) darker body, (2) presence of sinuated outer and distal margins of male first pleopod, (3) presence of double rows pectinated scales on exopod of fifth pleopod, (4) numerous aesthetascs of antennule and (5) less numerous setae on pereopods.

The present new species is also closely allied to *Lucasioides toyamaensis* Nunomura, 2008 reported from the nest material of a Japanese mole *Mogera imaizumii*, Nanto-shi, Toyama, but the former is separated from the latter in the following features: (1) sinuate margin of exopod of male pleopod 1, (2) weaker protrusion on outer border of male pereopod 7, (3) small but numerous ommatidia of eyes, (4) less numerous aesthetascs of antennule, (5) longer exopod of pleopod 5, (6) darker body and (7) lacking concavity on outer margin of exopod of male pleopod 2.

The present new species is also allied to *L.kobarii*, reported from Kanto Area(Nunomura, 1987), but the former differs from the latter in the following features: (1) not so protruded carpus of seventh pereopod in male, (2) sinuate margin of exopod of male pleopod 1, (3) lack of bifurcated teeth of lateral endite of maxillula, (4) more sparse setae on inner margin of pereopod 1, (5) less numerous aesthetascs on antennule and (6) acuter tip of pleotelson.

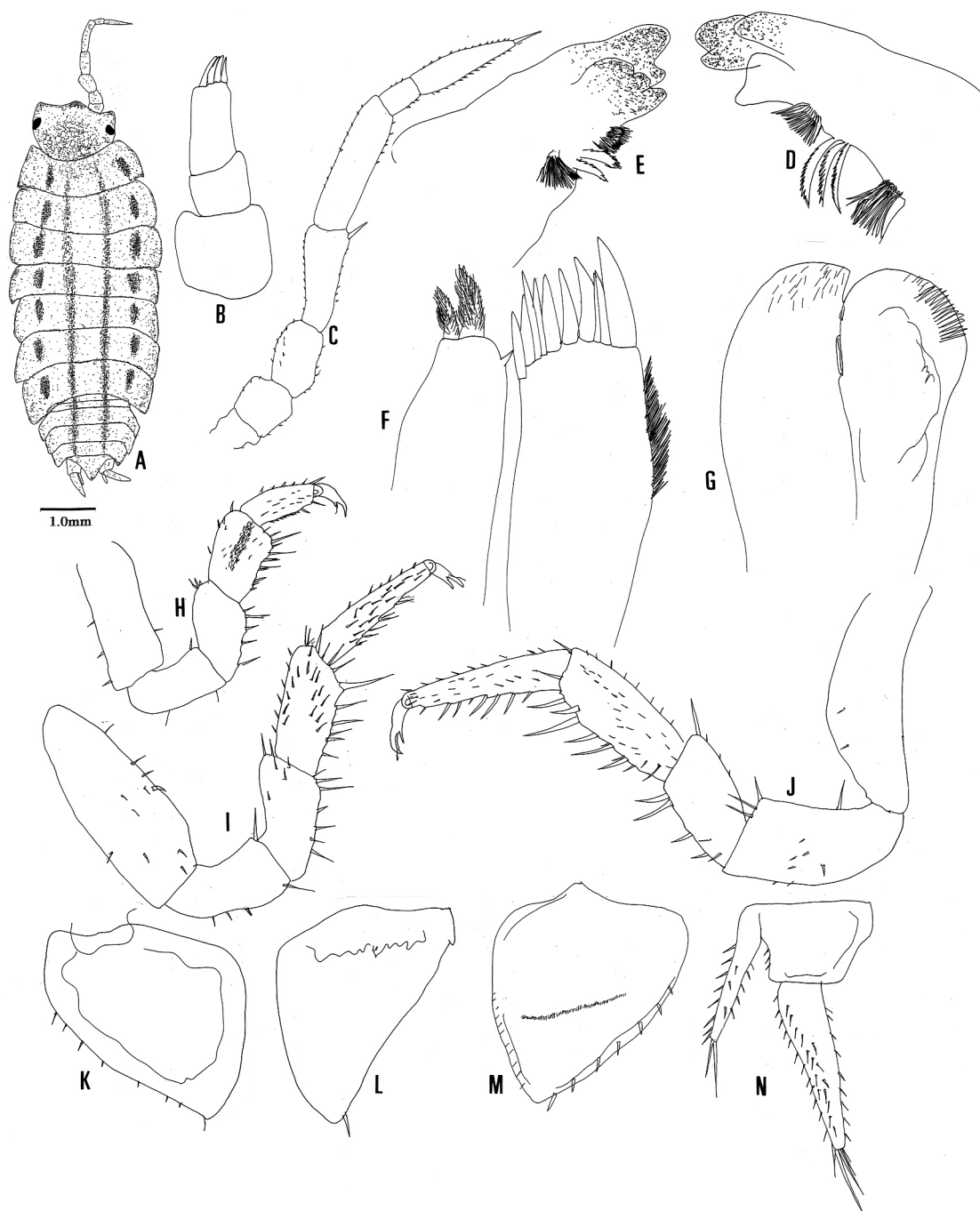


***Agnara* sp.**

(Figs. 4-5)

*Material examined*: 1 ♀ (7.0 mm in body length), Memorial Art Gallery of Gyujin Takamura, Toyama Municipal Volkcraft Village, east foot of Kurehayama Hill, Toyama-shi, 4, July 2012, coll. Noboru Nunomura. This specimen is deposited at Toyama Science Museum, Toyama (TOYA Cr-23391).

*Description*: Body (Fig. 4A) 2.5 times as long as wide. Color pale brown, with darker longitudinal patterns on dorsal surface. All the noduli lateralis (Fig.5) near the lateral margin. Pleonal somites subequal in length. Pleotelson right-triangle.



**Fig. 4** *Agnara* sp.

A, Dorsal view of body; B, Antennule; C, Antenna; D, Right mandible; E, Left mandible; F, Maxillula; G, Maxilla; H, Pereopod 1; I, Pereopod 6; J, Pereopod 7; K, Pleopod 3; L, Pleopod 4; M, Pleopod 5, N, Uropod (All : female from Toyama Municipal Volkcraft Village).

Antennule (Fig. 4B) 3-segmented; terminal segment with 4 aesthetascs at the tip.

Antenna (Fig. 4C), reaching posterior half of second pereonal somite, flagellum two-segmented, distal segment 2.9 times longer than the first.

Right mandible (Fig. 4D): pars incisiva 3-headed; lacinia mobilis not chitinized and forms a single tooth; 3 penicils; processus molaris represented by a tuft of setae. Left mandible (Fig. 4E): pars incisiva incisiva 2-headed; lacinia mobilis incisiva 3-headed; 2 penicils; processus molaris represented by a tuft of setae. Maxillula (Fig. 4F): mesial endite with 2 plumose setae and a small apical projection; lateral endite with 10 simple setae on distal end. Maxilla (Fig. 4G) bilobed; medial lobe a little wider than lateral lobe; lateral lobe sinuate. Maxilliped broken and missing.

Pereopod 1(Fig. 4H): basis and ischium with 1-3 setae on both margins; merus with 5 setae on inner margin; carpus with a relatively narrow area for antenna grooming-brush, propodus relatively short, about a dozen setae on inner margin.

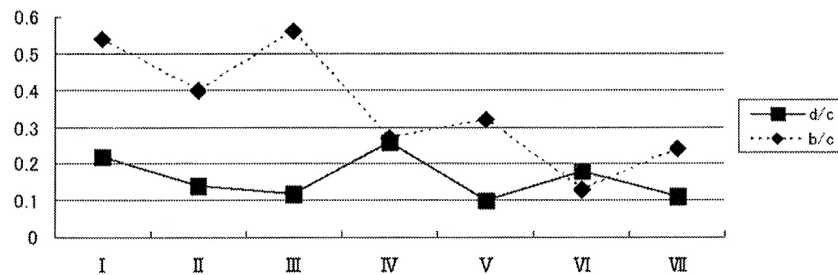
Pereopod 6(Fig. 4I): basis 2.6 times as long as wide; ischium half-length of basis, with 4 setae on inner margin; merus with 7-simple setae on inner margin; carpus with 8 simple setae on inner margin.

Pereopod 7(Fig. 4J) a little longer than pereopod 6; basis ; ischium three-fourths as long as basis, with 3 setae on outer distal area; merus with carpus with 8-sinmle setae on inner margin; propodus a little longer than carpus, with 8 setae on inner margin.

Pleopod 3(Fig. 4K): exopod rounded and right-angled triangle, with 8 setae on outer margin. Pleopod 4 (Fig. 4L): exopod rounded right-angled triangle; with a seta on outer margin. Pleopod 5 (Fig. 4M): exopod rounded right angled triangular; a row of pectinated scales located on dorsal surface and 7 setae on outer margin.

Uropod (Fig.4 N): peduncle low-rectangular ; endopod twice as long as peduncle, with 4-5 setae at the tip; exopod 85% as long as endopod.

**Remarks:** The present species is most closely allied to *Agnara pannuosus* reported from Hakui, Ishikawa Prefecture (Nunomura, 1987). But the former is separated from the latter in the following features: (1) spotted darker patterns on pereonal somite, (2) smaller eyes, (3) shorter carpus of pereopod 1, (4) less numerous setae on pereopod 1 and (5) numerous penicils on mandible. Unfortunately only an imperfect specimen was available to my disposal and no male specimens was not collected, therefore, I refrained to establish a new species.



**Fig. 5** *Agnara* sp.

Position of noduli lateralis of a female specimen from Toyama Municipal Volkcraft Village).



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